

CROSBY & OVERTON

Environmental Management Inc.

11791 Monarch Street • Garden Grove, California 92641
(714) 893-2468

**SITE ASSESSMENT INVESTIGATION FOR
UNDERGROUND TANKS REMOVED
AT**

**DOUGLAS AIRCRAFT COMPANY C6 FACILITY
19503 SOUTH NORMANDIE AVENUE
TORRANCE, CALIFORNIA**

**PREPARED BY: CROSBY & OVERTON ENVIRONMENTAL
MANAGEMENT, INC.
11791 MONARCH STREET
GARDEN GROVE, CALIFORNIA 92641**

FEBRUARY 8, 1988

PREPARED BY:

Brad Johnston

**BRAD JOHNSTON
GEOLOGIST**

REVIEWED BY:

Roger Nielson

**ROGER NIELSON
SR. GEOLOGIST
CA REG. #1801**

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE</u>
INTRODUCTION	1
TANK EXCAVATION SAMPLING	1
SITE ASSESSMENT ACTIVITIES	4
GEOLOGICAL ANALYSIS	6
RESULTS	7
CONCLUSIONS	9
RECOMMENDATIONS	9

FIGURES

FIGURE 1 -	SITE PLAN	3
FIGURE 2 -	LOCATION MAP, TANK 27T	12
FIGURE 3 -	LOCATION MAP, TANK 28T	13
FIGURE 4 -	LOCATION MAP, TANK 31T	14
FIGURE 5 -	LOCATION MAP, TANK 32T	15
FIGURE 6 -	LOCATION MAP, TANK 33T	16
FIGURE 7 -	LOCATION MAP, TANK 37T	17

TABLES

TABLE 1 -	LABORATORY RESULTS, TANK EXCAVATION SAMPLES .	2
TABLE 2 -	LABORATORY RESULTS, DRILLING SAMPLES . . .	11

APPENDICES

APPENDIX A -	DRILLING LOGS
APPENDIX B -	COMPLETE LABORATORY RESULTS

INTRODUCTION

On September 22, 1987, Crosby & Overton Environmental Management, Inc. (C&O EMI) removed twelve (12) underground petroleum product storage tanks from the C6 Torrance facility of Douglas Aircraft Company (DAC) located at 19503 South Normandie Avenue. Soil analyses performed in conjunction with the tank removals had indicated the presence of petroleum hydrocarbons in six of the twelve excavations. Inspector Franco of the Los Angeles City Fire Department (LACFD) issued a notice on October 26, 1987, requiring a site assessment. DAC subsequently retained C&O EMI to conduct this site assessment to determine the extent of petroleum hydrocarbons in the soil.

TANK EXCAVATION SAMPLING

As each tank was removed from its excavation, soil samples were taken from the bottom of each tank excavation as directed by Inspector Franco. Samples were placed in glass jars with teflon-lined caps and packed in ice for delivery to West Coast Analytical Services under proper chain of custody procedures.

These samples were analyzed for Fuel Hydrocarbons by modified EPA 8015, for Volatile Aromatic Hydrocarbons by EPA 8020 and for Total Lead by EPA 6020. Table 1 contains a summary of all laboratory results. Six of the tank excavations exhibited detectable levels of hydrocarbons, while the remaining six did not indicate the presence of petroleum hydrocarbons. Figure 1 shows the locations and capacities of the removed tanks where hydrocarbons were detected in the excavations.

TABLE 1

Summary of Laboratory Results from Tank Excavation Samples

Tank number	EPA 8015 Fuel Hydrocarbons (ppm)	EPA 8020				EPA 6020 Total Lead (ppm)
		B	T	X	E (ppm)	
27T	9800 Gasoline	1.1	24	310	25	302
28T	760 Gasoline	.6	.47	17	2.5	29
30T	ND	ND	.029	.001	.001	124
31T	3500 Gasoline	3.4	62	250	37	159
32T	400 Gasoline	.54	.6	24	3.1	16
33T	2500 Gasoline	1.2	8.8	36	16	34
34T	ND	ND	ND	ND	ND	7.4
35T	ND	ND	.001	.098	ND	7.2
36T	ND	ND	ND	ND	ND	8.2
37T	2000 diesel	.74	.17	1.0	.41	6.5
24T	EPA 8240 all compounds ND					
25T						

Detection Limit 8015 10ppm

Detection Limit 8020 1ppb

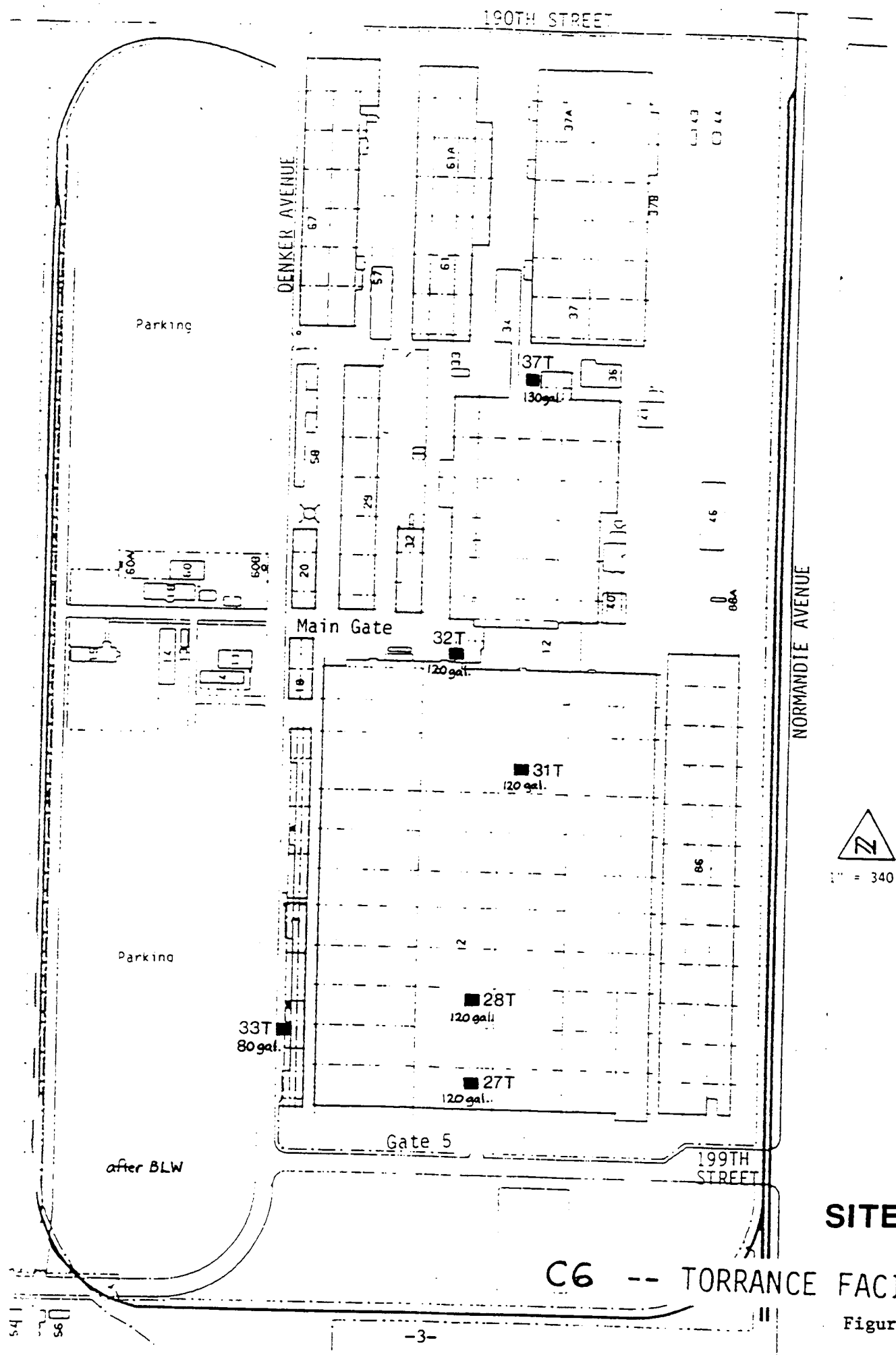
Detection Limit 6020 0.7ppm

B = benzene

T = toluene

X = xylene

E = ethyl benzene



SITE PLAN

C6 -- TORRANCE FACILITY

Figure 1

SITE ASSESSMENT ACTIVITIES

Upon receipt of Inspector Franco's request for a site assessment, a work plan was developed and submitted by DAC to LACFD on November 24, 1987. This work plan explained that tank excavations 27T, 28T, 31T, 32T, 33T and 37T were to be investigated by drilling one boring beside each excavation, slanted 20 degrees from vertical in order to pass beneath the former tank location. Drilling operations were commenced by C&O EMI on January 8 and were concluded on January 11, 1988.

Field Work. Details of each excavation and its associated borehole are shown in Figures 2 through 7. Tank excavations are labelled with the letter T and boring locations with the number 1.

Prior to rig move-on at each boring, each proposed boring location was hand tool excavated to a depth of approximately three feet. Two of the borings had to be moved slightly from the locations proposed in the workplan due to underground obstructions. Boring number 32-1 was moved into the bottom of tank excavation 32T and was drilled vertically to a depth of 20 feet, while boring 37-1 was moved onto the sloping edge of tank excavation 37T and was drilled at an angle approximately 10° from vertical to a depth of 25 feet.

Accessibility was limited around tank excavations 27T, 28T and especially restricted at 31T. A portable drilling rig was used to drill borings 27-1 and 28-1 to a depth of 25 feet, but the

doorway leading to tank excavation 31T was too small for access by the portable rig. As a result, drilling of boring 31-1 was accomplished using a hand operated auger with a 3" diameter sample sleeve driven as deep as possible to 8 feet below grade, or 2 feet below the bottom of backfill in native soil. Boring 33-1 was drilled as proposed in the work plan to 20 feet.

Drilling operations were performed with a 6" diameter hollow stem continuous-flight auger for borings 32-1, 33-1 and 37-1. The indoor locations of borings 27-1 and 28-1 necessitated the use of a portable rig that used a 6" diameter solid stem continuous-flight auger. Soil samples were taken with a 2 1/2" ID split spoon sample tool driven 18" ahead of the auger bit at five foot intervals. As each boring was drilled, accessible surfaced cuttings were placed into 55 gallon drums and stored at each location for appropriate disposal.

Core samples and surfaced drill cuttings were analyzed on site for potential presence of hydrocarbons and geological information, whereupon the data was recorded on the drilling logs presented in Appendix A. Field detection of hydrocarbons was accomplished through the use of a Photo Ionization Detector (PID) as well as visual and olfactory inspection.

Laboratory Analysis. Immediately upon obtaining the core samples, the center section was trimmed, capped, sealed with tape and placed on ice in an ice chest. At the conclusion of daily drilling operations, selected core samples were transferred

following required chain of custody procedures to Chemical Research Laboratories for analysis.

A total of eleven (11) core samples out of twenty-three (23) taken (two from all borings except 31-1, for which only one bottom sample was chosen) were submitted for laboratory analysis based on data from PID measurements, odor and sampling depth.

All samples submitted to the laboratory were analyzed for Total Petroleum Hydrocarbons using EPA 8015 and benzene, toluene, xylene and ethylbenzene (BTXE) by EPA 8020. A summary of the laboratory analyses from the drilling program is presented in Table 2, and complete laboratory reports are contained in Appendix B.

GEOLOGICAL ANALYSIS

Drilling data indicates that the site is immediately underlain by one to two feet of mixed sand, gravel and clay imported fill material. Backfill material in the tank excavations varied from well sorted coarse sand to sandy clays. Below this fill are natural sediments consisting of uniform silty, chalky and clayey fine-grained sands. There was very little local variation and permeabilities were generally poor with no significant avenues for vertical or horizontal migration of fluids.

The C6 site is approximately 50 feet above Mean Sea Level (MSL). Groundwater elevation data collected on November 6, 1987 by Woodward-Clyde Consultants indicates that the water table is over

21 feet below MSL. The depth to groundwater is therefore approximately 70 feet below grade.

RESULTS

The first tank excavation to be investigated was for 27T which held a 120 gallon gasoline tank, used as generator reserve fuel. Field observations during drilling of boring 27-1 indicated that hydrocarbon levels beneath this location decreased consistently with depth as indicated by PID readings of 230 ppm at 10 feet and zero at 25 feet. Laboratory analysis (see Table 2 and Appendix B) of the sample taken at 10 feet showed 310 ppm total hydrocarbons while the sample from 25 feet did not yield detectable levels of total hydrocarbons or BTXE.

Similar results were obtained for tank excavation 28T, which also held a 120 gallon generator reserve gasoline tank. Boring 28-1 exhibited field PID readings from a maximum of 220 ppm at 10 feet to 8 ppm at 25 feet. Laboratory analysis of samples at 10 feet and 25 feet showed 610 ppm and 1 ppm of total hydrocarbons, respectively.

Boring 32-1 was drilled beneath excavation 32T and exhibited a hydrocarbon concentration profile at shallower depths than those discussed above. The tank that existed in this location was also a 120 gallon gasoline reserve tank. The only positive field indication of hydrocarbons in this boring was a PID reading of 45 ppm at 10 feet. Laboratory analysis of the 10 foot sample showed 360 ppm total hydrocarbons and no detectable hydrocarbons at 20 feet.

Tank 33T was a generator reserve gasoline tank with a capacity of 80 gallons. The associated boring 33-1 showed no evidence of hydrocarbons during drilling operations. Laboratory analysis on samples from 10 feet and 20 feet also showed no detectable levels of hydrocarbons.

Tank 37T held approximately 130 gallons of reserve diesel fuel and was set near the top of an estimated ten feet of mixed sand and clay backfill. Drilling of boring 37-1 produced a sample of this backfill at 10 feet that showed 140 ppm of total hydrocarbons. Field observations indicated hydrocarbon levels decreased with depth below the 10 foot level. Laboratory analysis of the 25 foot sample showed no detectable levels of hydrocarbons.

Very limited accessibility at tank excavation 31T precluded the use of a motorized drill rig so a hand auger was driven as deep as possible into native soil in an attempt to establish a hydrocarbon concentration profile. Laboratory data from the tank excavation sampling program in conjunction with this boring data was used. The hand auger sample was taken 3 feet below the excavation bottom and 2 feet into native soil, and yielded a total hydrocarbon level of 1300 ppm as determined by laboratory analysis.

CONCLUSIONS

All of the borings drilled at the subject site (with the exception of 31-1 which was of limited depth) encountered no detectable hydrocarbons below a maximum depth of 25 feet. The relatively small maximum capacity of these tanks (130 gallons) minimized the amount of product that could have been released into the surrounding soil. Also, generally poor permeability of the native silty sands beneath the tanks restricted vertical migration of this product to a maximum of 25 feet. Horizontal migration has also been restricted by lack of permeable strata or fracture systems.

Boring 31-1 was not of sufficient depth to obtain a sample of soil with no detectable petroleum hydrocarbons. However, given that the sample taken from the bottom of the excavation showed 3500 ppm of total hydrocarbons and the auger sample 3 feet below that point showed 1300 ppm, it is assumed that the hydrocarbon concentration profile at this location is similar to those at the other 120 gallon tank sites.

RECOMMENDATIONS

Douglas Aircraft Company has chosen to use the December 1987 version of the Leaking Underground Fuel Tank (LUFT) Field Manual as a guideline for soil cleanup at this site. Based on the recommendations set forth in the LUFT Field Manual, DAC proposes to excavate the area beneath tanks 27T, 28T, 31T, 32T and 33T to a depth where Total Petroleum Hydrocarbon (TPH) levels are below

100 ppm. Since tank 37T contained diesel fuel, the maximum allowable TPH level at that site will be 1000 ppm. Soil from these excavations will be disposed of appropriately and imported backfill material will be used to restore the excavations to surface grade.

TABLE 2

Summary of Laboratory Results from Drilling Samples

oring number	Depth	EPA 8015	B	T	EPA 8020		(ppm)
		Fuel Hydrocarbons(ppm)			X	E	
27-1	10'	310	2	15	15	130	
	25'	ND	ND	ND	ND	ND	
28-1	10'	610	0	66	50	315	
	25'	1	ND	ND	ND	ND	
31-1	8'	1300	ND	25	16	150	
32-1	10'	360	2	1	4	41	
	20'	ND	ND	ND	ND	ND	
33-1	10'	ND	ND	ND	ND	ND	
	20'	ND	ND	ND	ND	ND	
37-1	10'	140	ND	ND	2	5	
	25'	ND	ND	ND	ND	ND	

Detection Limit 8015 1 ppm

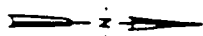
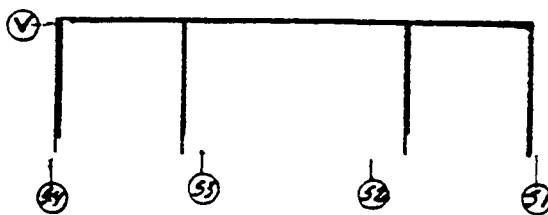
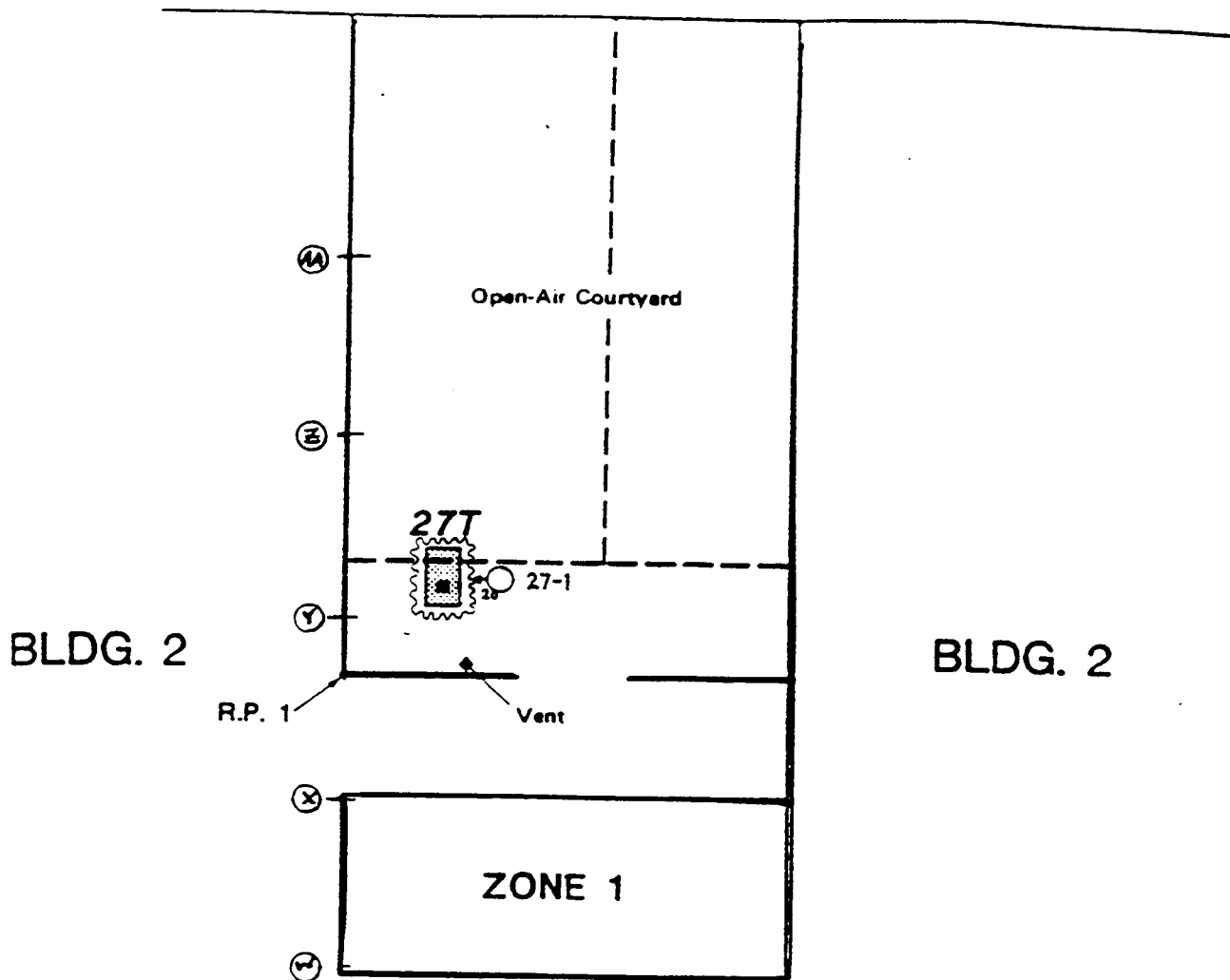
Detection Limit 8020 0.1 ppm

= benzene

T = toluene

= xylene

= ethyl benzene



0 10 20



SCALE, feet



CROSBY AND OVERTON

Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641



Outline of excavation



Location of boring, with angle and
direction of slant

modified from WCC

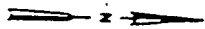
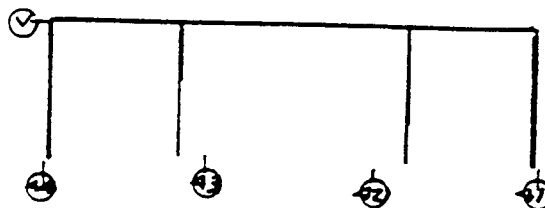
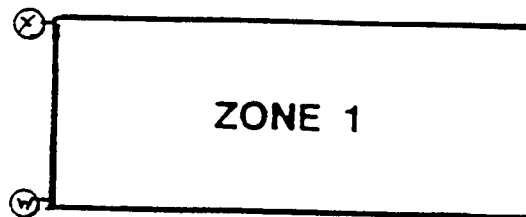
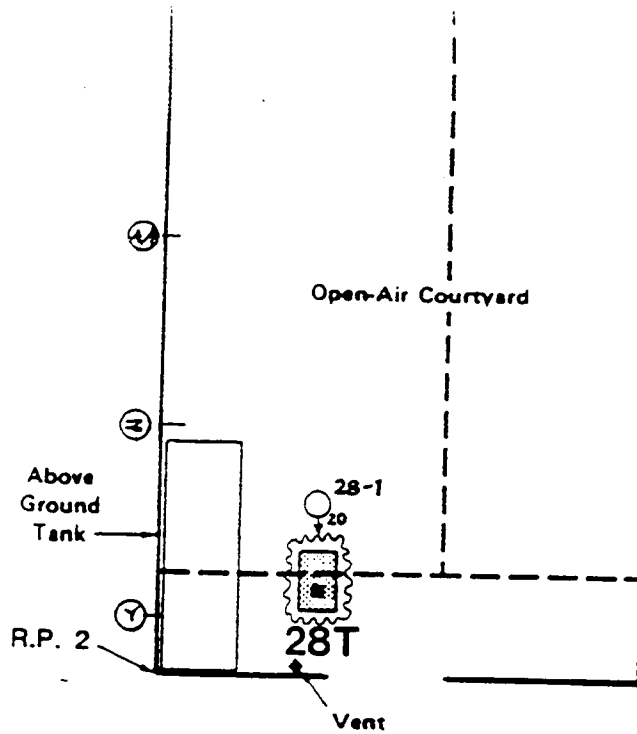
DOUGLAS AIRCRAFT CO.

LOCATION MAP FOR TANK 27T

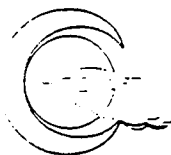
Figure
2

BLDG. 2

BLDG. 2



0 10 20
SCALE. feet



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641



Outline of excavation



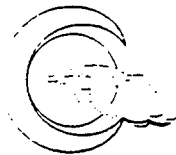
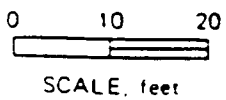
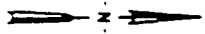
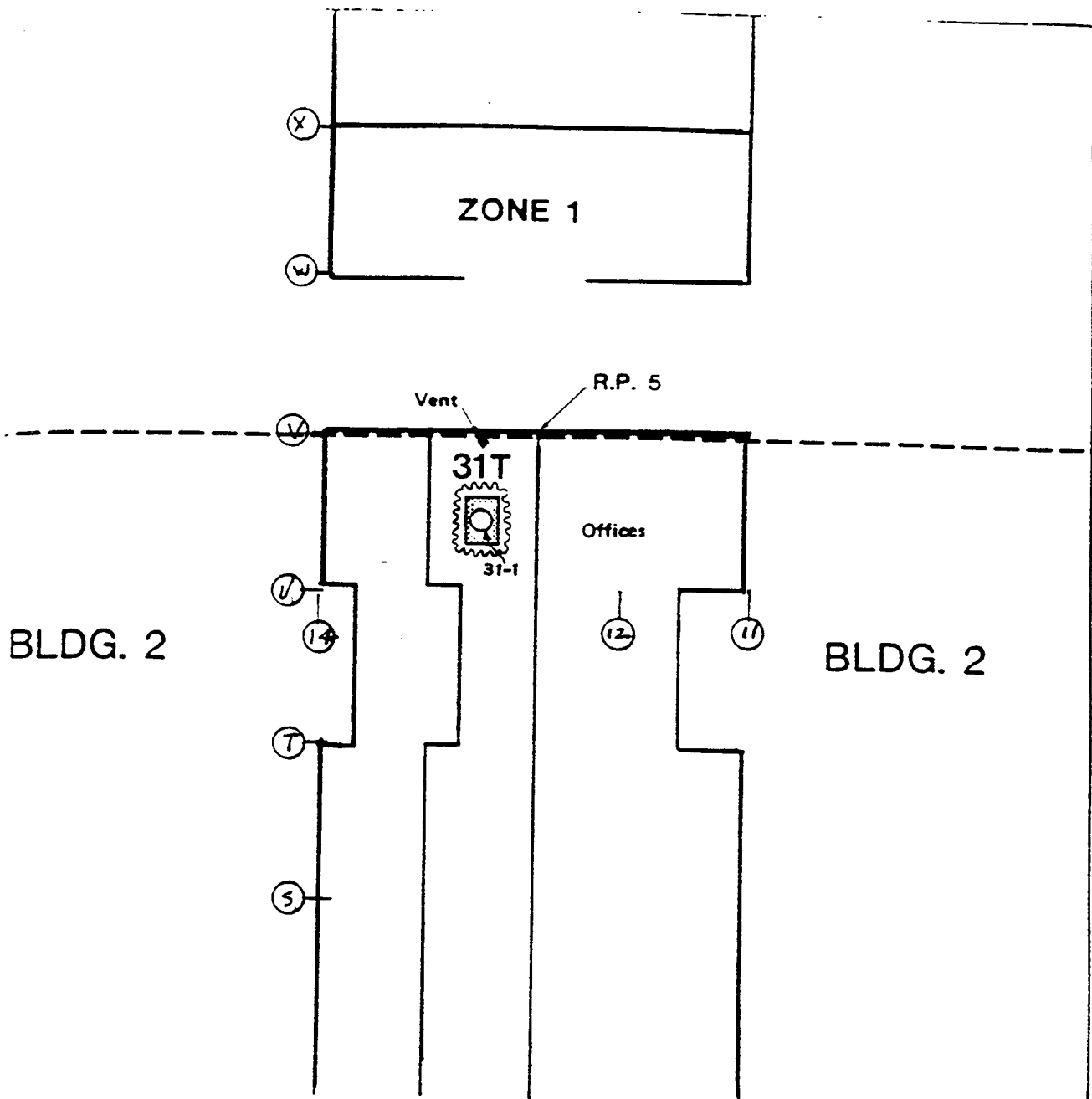
Location of boring, with angle and direction of slant

modified from WCC

DOUGLAS AIRCRAFT CO.

LOCATION MAP FOR TANK 28T

Figure
3



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641



Outline of excavation



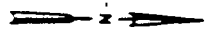
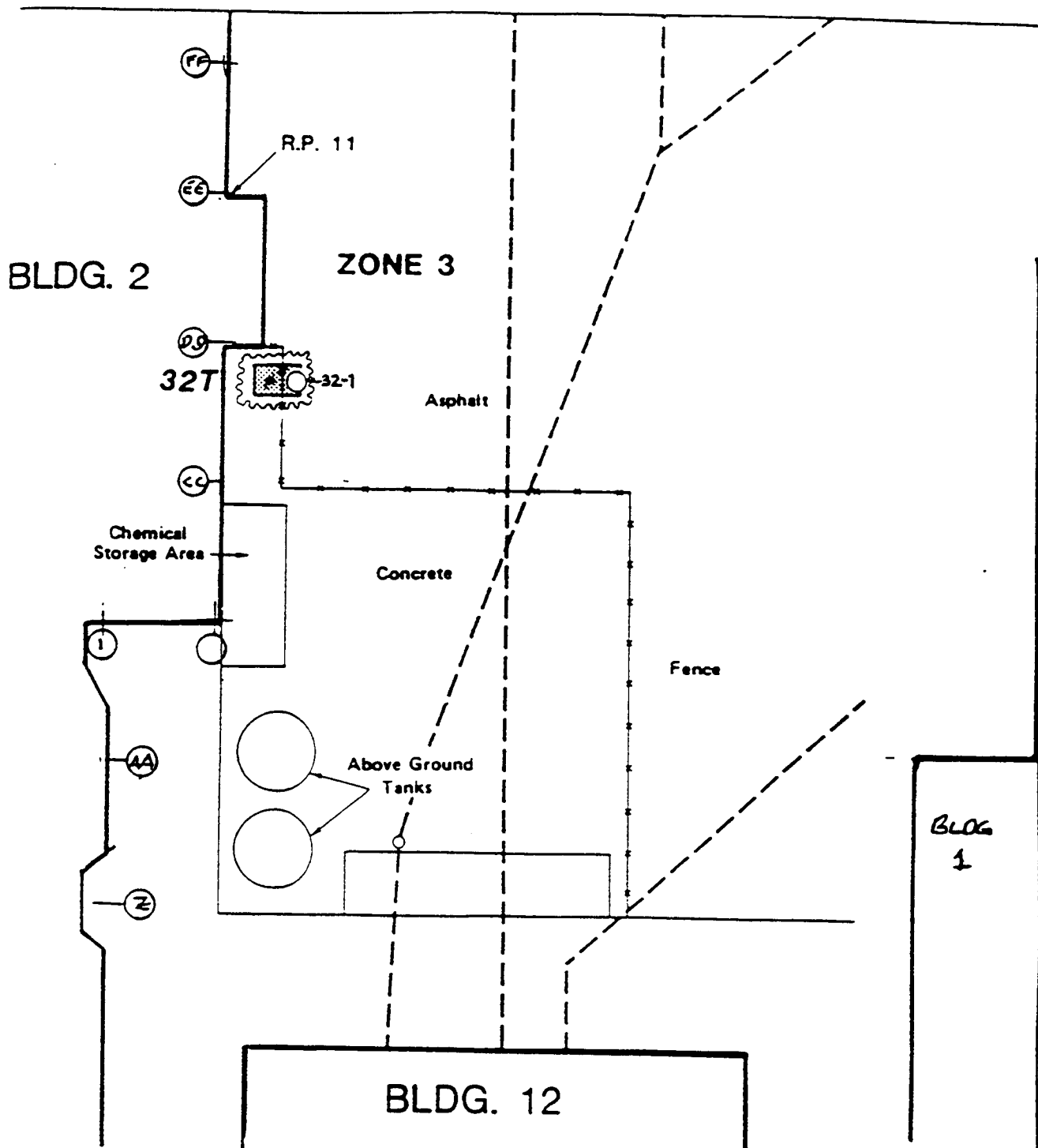
Location of boring

modified from WCC

DOUGLAS AIRCRAFT CO.

LOCATION MAP FOR TANK 31T

Figure
4



0 10 20
SCALE, feet



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641



Outline of excavation



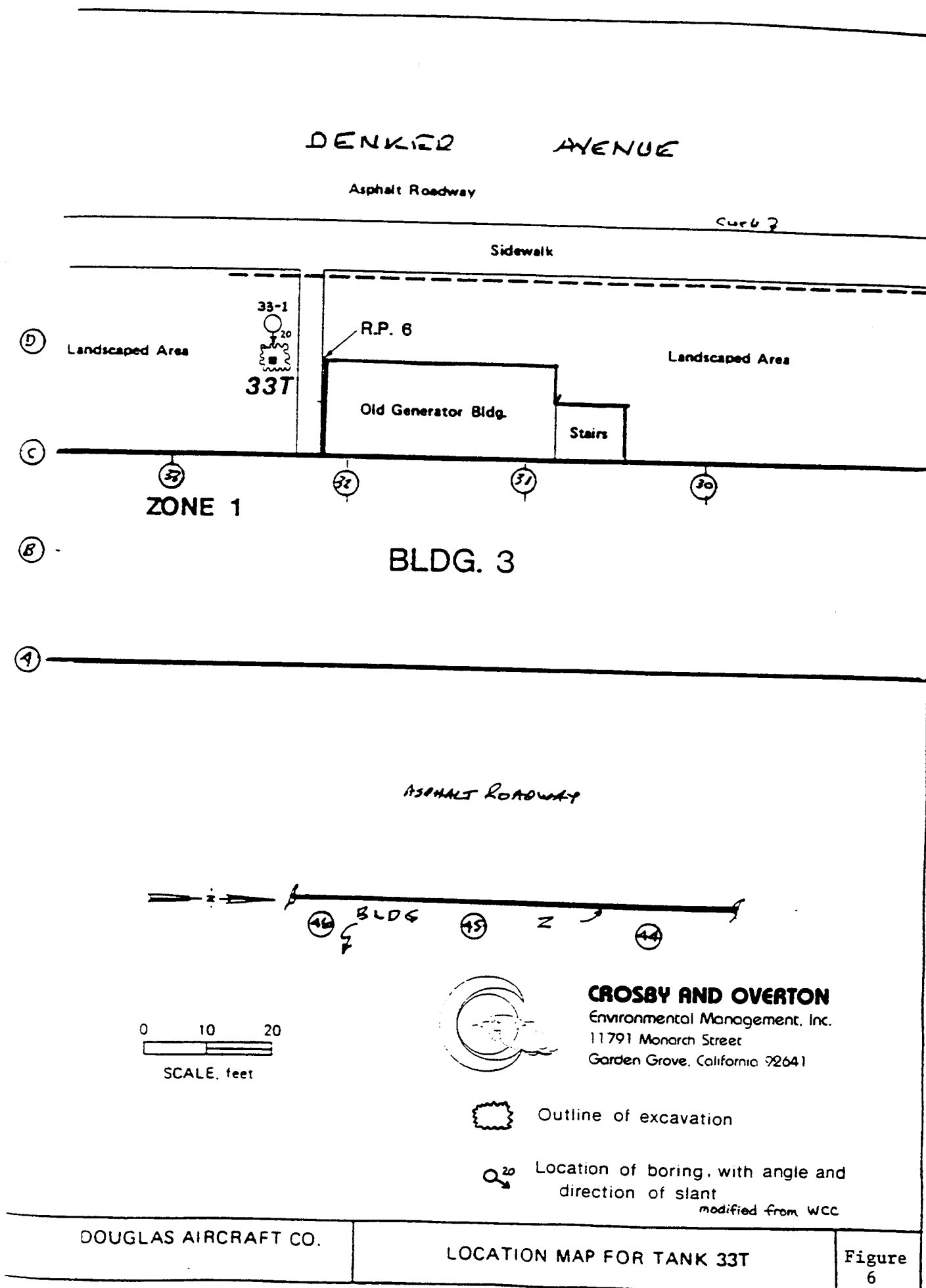
Location of boring

modified from WCC

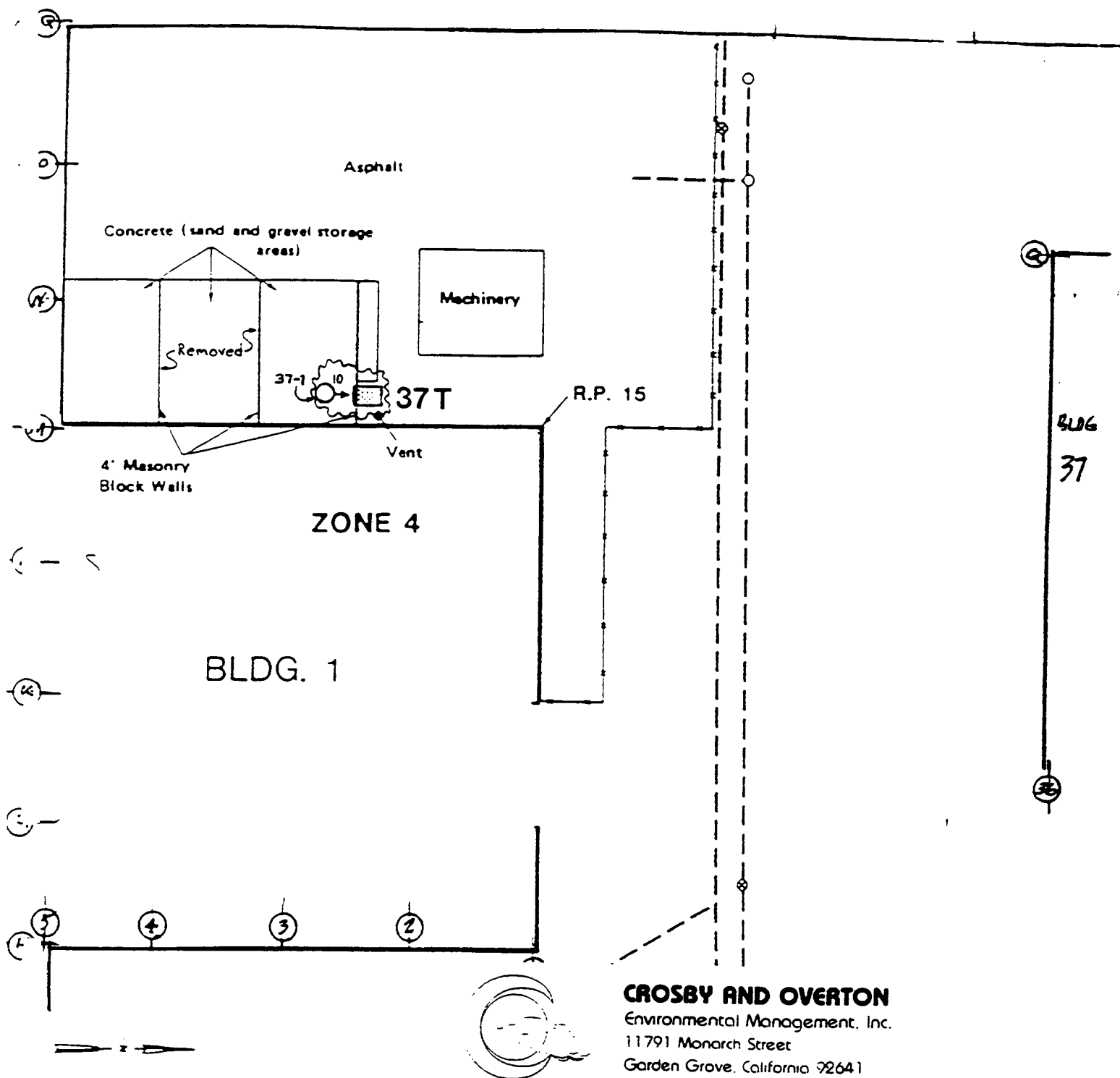
DOUGLAS AIRCRAFT CO.

LOCATION MAP FOR TANK 32T

Figure
5



PASSAGEWAY



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641



Outline of excavation



Location of boring, with angle and
direction of slant

modified from WCC

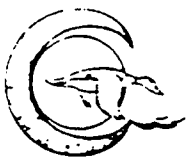
DUGLAS AIRCRAFT CO.

LOCATION MAP FOR TANK 37T

Figure
7

APPENDIX A
DRILLING LOGS

BORING/WELL NUMBER 27-1



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641

PROJECT Douglas Aircraft
LOCATION C6 Facility, Torrance
DATE DRILLED 1-8-88
SURFACE ELEVATION _____
SCREEN: DIA. _____ LENGTH _____
CASING: DIA. _____ LENGTH _____ TYPE _____
DRILLING COMPANY Interstate Soils
MILLER Mark

TOTAL DEPTH OF HOLE 25'
DEPTH TO WATER _____
SLOT SIZE _____
TYPE _____
DRILL METHOD Portable Solid Stem Auger
LOG BY Brad Johnston

DEPTH (FEET)	WELL CONST		PID (PPM)	SAMPLES			GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	TYPE	BLOW		
			0			17 30 37		Boring was slanted 20° from vertical and was started 3' from edge of excavation (surface grade)
10			230			37 41 50		Brn-dkbrn silty clay, mottled, sctrd f grn sd, sli moist, malleable, poor perm, no structures, no odor.
1			170			7 9 17		Tan fine grn sand, sli silty, uniform, v. sli moist fair perm, strong "sweet" odor.
20			40			12 16 32		Tan-brn f grn sd as above, sctrd tan silty clasts, sctrd blk stn, p-f perm, less odor.
2			0			27 50 54		Brn-gray silty f grn sd, uniform, clayey in part, sli moist, p-f perm, v sli odor.
								Tan-brn silty f grn sd as above, chalky, dry, poor perm, no odor.
								TD 25'

BORING/WELL NUMBER 28-1



CROSBY AND OVERTON

Environmental Management, Inc.

11791 Monarch Street

Garden Grove, California 92641

PROJECT Douglas Aircraft

LOCATION C6 Facility, Torrance

DATE DRILLED 1-8-88

SURFACE ELEVATION _____

SCREEN: DIA. _____ LENGTH _____

CASING: DIA. _____ LENGTH _____

DRILLING COMPANY Interstate Soils

RILLER Mark

TOTAL DEPTH OF HOLE 25'

DEPTH TO WATER _____

SLOT SIZE _____

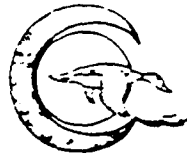
TYPE _____

DRILL METHOD Portable Solid Stem Auger

LOG BY Brad Johnston

DEPTH FEET	WELL CONST		PID (PPM)	SAMPLES			GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	TYPE	BLOW		
			0			13 22 29		Boring was slanted 20° from vertical and was started 4' from edge of excavation (surface grade)
			220			13 27 50		Dk brn silty clay, sctrd f grn sd, moist, malleable, poor perm, no odor.
			210			12 18 25		Tan-brn fine grn sd, sli silty, uniform, sctrd blk pp stn, clayey in part, sli moist, cohesive, poor perm, strong odor.
			130			14 31 50		Tan brn f grn sd as above, moist, poor-fair perm strong odor.
20			8			60 90 100		Tan brn f grn sd as above, sctrd blk, pp stn, sli moist, less odor, poor perm.
								Tan brn silty f grn sd, v. dnse, dry, poor perm no odor.
								TD 25'

B RING/WELL NUMBER 31-T



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641

PROJECT Douglas Aircraft

LOCATION C 6 Facility Torrance

DATE DRILLED 1-11-88

SURFACE ELEVATION _____

SCREEN: DIA. _____ LENGTH _____

CASING: DIA. _____ LENGTH _____

DRILLING COMPANY CROSBY & OVERTON EMI

DRILLER Brad Johnston

TOTAL DEPTH OF HOLE 8'

DEPTH TO WATER _____

SLOT SIZE _____

TYPE _____

DRILL METHOD Hand Auger

LOG BY Brad Johnston

DEPTH FEET	WELL CONST		PID (FPM)	SAMPLES			GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	TYPE	BLOW		
5			180					One sample was taken by hand auger 3' below bottom of excavation (8' below grade)
								Brn-gray mottled fine grn sand, sli silty, moist, p-f perm, strong odor.
								TD 8'

BORING/WELL NUMBER 32-1



CROSBY AND OVERTON

Environmental Management, Inc.

11791 Monarch Street

Garden Grove, California 92641

PROJECT Douglas Aircraft Assessment

LOCATION C6 Facility, Torrance

DATE DRILLED 1-11-88

SURFACE ELEVATION _____

TOTAL DEPTH OF HOLE 20'

DEPTH TO WATER _____

SCREEN: DIA. _____ LENGTH _____ SLOT SIZE _____

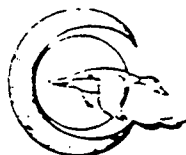
CASING: DIA. _____ LENGTH _____ TYPE _____

DRILLING COMPANY Crosby & Overton E.M.I. DRILL METHOD Hollow Stem Auger

DRILLER John Hale LOG BY Brad Johnston

DEPTH (FEET)	WELL CONST		PID (PPM)	SAMPLES			GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	TYPE	BLOW		
								Boring was vertically drilled and started in bottom of excavation (5' below grade)
5								No sample recovered - bottom of excavation at 5', very muddy
1			45			12 17 28		Brn-gray fine grn sand, sctrd cse sd, dense, silty in part, cohesive in part, wet (sli moist where consolidated), fair perm, fair odor
1			0			18 23 25		Tan-gray chalky silt, sctrd pp iron oxide stn, cohesive, moist, poor perm, no odor
20			0			15 20 27		Tan-brown chalky silt as above, no stn, sli moist, sli cohesive, poor perm, no odor
								TD 20'

BORING/WELL NUMBER 33-1



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641

PROJECT Douglas Aircraft

LOCATION C6 Facility, Torrance

DATE DRILLED 1-11-88

SURFACE ELEVATION _____

SCREEN: DIA. _____ LENGTH _____

CASING: DIA. _____ LENGTH _____ TYPE _____

DRILLING COMPANY Crosby & Overton EMI

OPERATOR John Hale

TOTAL DEPTH OF HOLE 20'

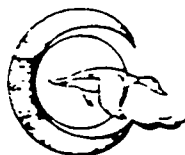
DEPTH TO WATER _____

DRILL METHOD Hollow Stem Auger

LOG BY Brad Johnston

DEPTH FEET	WELL CONST		PID (PPMD)	SAMPLES			GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	TYPE	BLOW		
0			0			24 26 28		Boring was slanted 20° from vertical and was started 4' from edge of excavation (surface grade)
5			0			7 18 23		Brn clayey silt, sctrd dk brn mineral stn, calcium carbonate veins, cohesive, sli moist, poor-fair perm, no odor.
10			0			20 23 28		Tan-brn fine grn sand, sli silty, sctrd borings 1mm diam, sctrd organic particles, mod cohesive, moist, fair perm, no odor.
15			0					Tan-brn f grn sd as above, moist, sctrd worm tubes and castings, moist, p-f perm, no odor.
20			0			18 20 23		Tan brn f grn sd as above, moist, no odor, poor perm
								TD 20'

BORING/WELL NUMBER 37-1



CROSBY AND OVERTON
Environmental Management, Inc.
11791 Monarch Street
Garden Grove, California 92641

PROJECT Douglas Aircraft
LOCATION C6 Facility, Torrance
DATE DRILLED 1-11-88
SURFACE ELEVATION _____
SCREEN: DIA. _____ LENGTH _____
CASING: DIA. _____ LENGTH _____
DRILLING COMPANY Crosby & Overton EMI
DRILLER John Hale

TOTAL DEPTH OF HOLE 25'
DEPTH TO WATER _____
SLOT SIZE _____
TYPE _____
DRILL METHOD Hollow Stem Auger
LOG BY Brad Johnston

DEPTH (FEET)	WELL CONST		PID (PMS)	SAMPLES			GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	TYPE	BLOW		
5			0			4 5 8		Boring was slanted 20° from vertical and started on edge of excavation (1' below grade)
10			12			7 14 28		Mixed backfill material-blk heavy clay, cse sd and gravel. Asphalt and concrete pcs. Wet, gd perm, no odor.
15			6			12 18 23		top spl: cse grn sand (backfill), dnse blk clay, wet, odor. btm spl: Tan-brn fine grn sand, sli silty, webbed gray stn, worm borings <1mm diam, prod sheen, diesel odor, moist.
20			0			17 25 28		Tan-brn f grn sd, v sli silty, cohesive, moist, p-f perm, no structures or stn, diesel odor.
25			0			10 16 22		Tan-brn f grn sd as above, scrtd iron oxide stn encrustd borings, sli moist, v sli odor, poor perm.
TD 25'								

APPENDIX B
COMPLETE LABORATORY RESULTS



Chemical Research Laboratories, Inc.

SOUTHERN CALIFORNIA DIVISION

7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • FAX: (714) 891-5917 • (800) LAB-1CRL

January 13, 1988

CROSBY & OVERTON EMI
11791 Monarch
Garden Grove, CA 92641
A.MN: Brad Johnston

ANALYSIS NO.: 800817-001/004
ANALYSES: EPA Method 8015,8020
DATE SAMPLED: 01/08/88
DATE SAMPLE REC'D: 01/08/88
PROJECT: DAC-Douglas Aircraft Co.

Enclosed with this letter is the report on the chemical and physical analyses on the samples from ANALYSIS NO: 800817-001/004 shown above.

The samples were received by CRL in a chilled state, intact, and with the chain-of-custody record attached.

Please note that ND() means not detected at the detection limit expressed within the parentheses.



REVIEWED AND APPROVED



Chemical Research Laboratories, Inc.

SOUTHERN CALIFORNIA DIVISION

7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • FAX: (714) 891-5917 • (800) LAB-1CRL

LABORATORY REPORT

OSBY & OVERTON EMI
1 791 Monarch
Garden Grove, CA 92641
ATTN: Brad Johnston

ANALYSIS NO.: 800817-001/004
ANALYSES: EPA Method 8115, 8020
DATE SAMPLED: 01/08/88
DATE SAMPLE REC'D: 01/08/88
DATE ANALYZED: 01/08/88
SAMPLE TYPE: Solid
PROJECT: DAC-Douglas Aircraft Co.

BTX, EPA METHOD 8020, (mg/kg)

**TOTAL PETROLEUM
HYDROCARBONS
EPA METHOD 8015
(mg/kg)**

<u>SAMPLE ID</u>	<u>BENZENE</u>	<u>TOLUENE</u>	<u>ETHYL BENZENE</u>	<u>TOTAL XYLENES</u>	
2/-1 10' Borings	2.	15.	15.	130.	310.
27-1 25' Borings	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(1.)
2 -1 10' Borings	ND(0.1)	66.	50.	315.	610.
2 -1 25' Borings	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	1.

CLIENT CROSBY & OVERTON FMI
 ADDRESS 11791 MONARCH
GARDEN GROVE, CA 92611
Purchase Order # 53189

- BAKERSFIELD
- A. COUNTY
- MOBILE LAB

PROJECT MANAGER
BRAD JOHNSTON
 PHONE NUMBER
(714) 893-2468

PROJECT NAME
PAC - DOUGLAS AIRCRAFT CO.

SAMPLERS: (Signature)
Brad Johnston

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE			SOLID	NO. OF CNTNRS	TESTS REQUIRED
				WATER		AIR			
				Comp.	Grab.				
27-1 10'	BORINGS	1-8-88					SOIL	1	8015 TOTAL HYDROCARBONS / B,T,X,E
27-1 25'	↓	↓					↓	1	↓
28-1 10'								1	
28-1 25'	↓	↓					↓	1	↓

Relinquished by: (Signature) <u>B. Johnston</u>	Received by: (Signature) _____	CRL will store sample for 30 days at no charge. Storage after 30 days is charged at \$10 per month per sample. Disposal of sample is charged at \$10 per sample. Please indicate the disposition of your sample. 1. Client retrieved _____ by _____ 2. Lab Disposal _____ by _____ 3. Store for _____ days. by _____ 4. Other _____ by _____	Date/Time
Relinquished by: (Signature) _____	Received by: (Signature) _____		Date/Time
Relinquished by: (Signature) _____	Received by Mobile Laboratory for field analysis: (Signature) _____		Date/Time
Dispatched by: (Signature) _____	Date/Time _____	Received for Laboratory by: <u>Don Binkley</u>	Date/Time <u>1/8/88 4:00</u>

Method of Shipment: _____

Special Instructions: HARD COPY ASAP
2 DAY TURNAROUND CINDY OK'd 50% added charge

I hereby authorize the performance of the above indicated work.

SOURCE: Adapted from U.S. EPA, 1985

DISTRIBUTION: White with report, Yellow to CRL, Pink to Courier, Gold to Sample Control

BOE-C6-0070969



Chemical Research Laboratories, Inc.

SOUTHERN CALIFORNIA DIVISION

7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • FAX: (714) 891-5917 • (800) LAB-1CRL

January 14, 1988

ROSBY AND OVERTON
191 Monarch Street
Garden Grove, CA 92641
ATTN: Keith Kishishita

ANALYSIS NO.: 801112-001/007
ANALYSES: EPA Method 8015/8020
DATE SAMPLED: 1/11/88
DATE SAMPLE REC'D: 1/11/88
PROJECT: Douglas Aircraft-DAC

Enclosed with this letter is the report on the chemical and physical analyses on the samples from ANALYSIS NO: 801112-001/007 shown above.

The samples were received by CRL in a chilled state, intact, and with the chain-of-custody record attached.

Please note that ND() means not detected at the detection limit expressed in the parentheses.



REVIEWED AND APPROVED



Chemical Research Laboratories, Inc.

SOUTHERN CALIFORNIA DIVISION

7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • FAX: (714) 891-5917 • (800) LAB-1CRL

LABORATORY REPORT

OSBY AND OVERTON
11791 Monarch Street
Garden Grove, CA 92641
ATTN: Keith Kishishita

ANALYSIS NO.: 801112-001/007
ANALYSES: EPA Method 8015/8020
DATE SAMPLED: 1/11/88
DATE SAMPLE REC'D: 1/11/88
DATE ANALYZED: 1/11/88
SAMPLE TYPE: Solid
PROJECT: Douglas Aircraft-DAC

BTX, EPA METHOD 8020, (mg/kg)

TOTAL PETROLEUM
HYDROCARBONS
EPA METHOD 8015
(mg/kg)

<u>SAMPLE NUMBER</u>	<u>BENZENE</u>	<u>TOLUENE</u>	<u>ETHYL BENZENE</u>	<u>TOTAL XYLENES</u>	
1 T 8' TK. 31T	ND(.1)	25.	16.	150.	1,300.
2-T 10' TK. 32T	2.	1.	4.	41.	360.
2 T 20' TK. 32T	ND(.1)	ND(.1)	ND(.1)	ND(.1)	ND(1.)
3 T 10' TK. 33T	ND(.1)	ND(.1)	ND(.1)	ND(.1)	ND(1.)
3-T 20' TK. 33T	ND(.1)	ND(.1)	ND(.1)	ND(.1)	ND(1.)
7-T 10' TK. 37T	ND(.1)	ND(.1)	2.	5.	140.
7 T 25' TK. 37T	ND(.1)	ND(.1)	ND(.1)	ND(.1)	ND(1.)

CLIENT CROSBY & OVERTON EMIADDRESS 11791 MONARCH ST
GARDEN GROVE 92641PURCHASE ORDER # 53194

PROJECT NAME

DOUGLAS AIRCRAFT - DAC

- BARNESFIELD
- A. COUNTRY
- MOBILE LAB

PROJECT MANAGER

BRAD JOHNSTON

PHONE NUMBER

(714) 893-2468

SAMPLERS: (Signature)

Brad Johnston

SAMPLE NUMBER	'LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE			SOLID	NO. OF CNTNRS	TESTS REQUIRED
				WATER		AIR			
				Comp.	Grab.				
31-T 8'	TANK 31T	1-11					SOIL	1	8015 TOTAL PETRO HCS / BTXE
32-1 10'	TANK 32T	↓					↓	1	↓
32-1 20'	"							1	
33-1 10'	TANK 33T							1	
33-1 20'	"							1	
37-1 10'	TANK 37T							1	
37-1 25'	"	↓					↓	1	↓

Relinquished by: (Signature)

Brad Johnston

Relinquished by: (Signature)

Relinquished by: (Signature)

Dispatched by: (Signature)

Received by: (Signature)

Received by: (Signature)

Received by Mobile Laboratory for field analysis:
(Signature)

Date/Time

Received for Laboratory by:

CRL will store sample for 30 days at no charge. Storage after 30 days is charged at \$10 per month per sample. Disposal of sample is charged at \$10 per sample. Please indicate the disposition of your sample.

1. Client retrieved _____ by _____
2. Lab Disposal _____ by _____
3. Store for _____ days. by _____
4. Other _____ by _____

Date/Time

1/11/88

Date/Time

Date/Time

Date/Time

1/11/88 4:55 PM

Method of Shipment:

I hereby authorize the performance of the above indicated work.

Special Instructions:

ONE DAY TURN AROUND TIME - HARDCOPY ASAP

SOURCE: Adapted from U.S. EPA, 1985

CCR-100

DISTRIBUTION: White with report, Yellow to CRL, Pink to Courier, Gold to Sample Control